

What Is Claimed Is:

1. A tunable Fabry-Perot filter comprising:  
a bottom mirror mounted to the top of a substrate;  
5 a bottom electrode mounted to the top of said  
bottom mirror;  
a thin membrane support atop said bottom  
electrode;  
a top electrode fixed to the underside of said  
10 thin membrane support;  
a reinforcer fixed to the outside perimeter of  
said thin membrane support; and  
a confocal top mirror set atop said thin membrane  
support, with an air cavity being formed between said  
15 bottom mirror and said top mirror;  
wherein said top electrode and said bottom  
electrode are spaced further apart from one another  
than said top mirror is spaced from said bottom mirror.

20 2. A tunable Fabry-Perot filter according to  
claim 1 wherein said top electrode is spaced further  
from said substrate than said top mirror is spaced from  
said substrate.

3. A tunable Fabry-Perot filter according to claim 1 wherein the top surface of said bottom mirror is located further from said substrate than the top surface of said bottom electrode.

4. A tunable laser comprising:  
a bottom mirror mounted to the top of a substrate;  
a gain region mounted to the top of said bottom mirror;  
a bottom electrode mounted to the top of said gain region;  
a thin membrane support atop said bottom electrode;  
a top electrode fixed to the underside of said thin membrane support;  
a reinforcer fixed to the outside perimeter of said thin membrane support; and  
a confocal top mirror set atop said thin membrane support, with an air cavity being formed between said bottom mirror and said top mirror,

wherein said top electrode and said bottom electrode are spaced further apart from one another than said top mirror is spaced from said bottom mirror.

5           5.    A tunable laser according to claim 4 wherein said top electrode is spaced further from said substrate than said top mirror is spaced from said substrate.

10           6.    A tunable laser according to claim 4 wherein the top surface of said bottom mirror is located further from said substrate than the top surface of said bottom electrode.

15           7.    A tunable Fabry-Perot filter comprising:  
a bottom mirror mounted to the top of a substrate;  
a bottom electrode mounted to the top of said bottom mirror;

20           a thin membrane support atop said bottom electrode;

          a top electrode fixed to the underside of said thin membrane support;

a reinforcer fixed to the outside perimeter of  
said thin membrane support; and

a confocal top mirror set atop said thin membrane  
support, with an air cavity being formed between said  
5 bottom mirror and said top mirror;

wherein said top electrode and said bottom  
electrode extend toward one another.

8. A tunable Fabry-Perot filter according to  
claim 7 wherein said top electrode and said bottom  
10 electrode are interdigitated.

9. A tunable Fabry-Perot filter according to  
claim 8 wherein said top electrode and said bottom  
15 electrode comprise concentric circles.

10. A tunable Fabry-Perot filter according to  
claim 8 wherein said top electrode and said bottom  
electrode comprises parallel plates.

11. A tunable Fabry-Perot filter according to  
claim 8 wherein said top electrode and said bottom  
electrode comprise a plurality of interspaced posts.

12. A tunable laser comprising:

a bottom mirror mounted to the top of a substrate;

a gain region mounted to the top of said bottom

5 mirror;

a bottom electrode mounted to the top of said gain region;

a thin membrane support atop said bottom electrode;

10 a top electrode fixed to the underside of said thin membrane support;

a reinforcer fixed to the outside perimeter of said thin membrane support; and

15 a confocal top mirror set atop said thin membrane support, with an air cavity being formed between said bottom mirror and said top mirror,

wherein said top electrode and said bottom electrode extend toward another.

20 13. A tunable VCSEL according to claim 12 wherein said top electrode and said bottom electrode are interdigitated.

14. A tunable VCSEL according to claim 13 wherein said top electrode and said bottom electrode comprise concentric circles.

5           15. A tunable VCSEL according to claim 13 wherein said top electrode and said bottom electrode comprises parallel plates.

10           16. A tunable VCSEL according to claim 13 wherein said top electrode and said bottom electrode comprise a plurality of interspaced posts.